

REMARKS

By this amendment, applicants have amended page 9, line 29 of the specification to adopt the suggestion made by the Examiner in the last paragraph on page 3 of the office action and have amended page 10, line 11 to provide a reference numeral 6b for the "end plate" as also suggested by the Examiner. Page 11, line 30 of the specification has been amended to correct a typographical error.

Applicants have cancelled claims 2, 3, 13 and 14 without prejudice or disclaimer, have amended claim 5 to correct a clerical error and amended claim 9 to depend only from one of claims 5 - 8.

Applicants have amended the drawings to correct the underlining and lead lines and to add reference numeral "6b" to the drawings, as required by the Examiner in the first paragraph on page 3 of the office action.

Applicants thank the Examiner for the telephonic interview conducted between the Examiner and the undersigned on October 21, 2003. The Examiner's statement of the substance of the interview is an accurate summary of the discussions between the Examiner and the undersigned.

In view of the foregoing amendments to the specification, claims and drawings, reconsideration and withdrawal of the objection to the drawings in the first paragraph on page 3 of the office action, the objection to the specification in the second paragraph on page 3 of the office action and the objection to claim 5 in the first paragraph on page 4 of the office action are requested.

Claims 2, 3, 5 - 11 and 13 - 17 stand rejected under 35 USC 102(b) as allegedly being anticipated by United States Patent No. 4,543,989 to Lorson. Applicants traverse this rejection and request reconsideration thereof.

The present invention relates to a compressor including a compression chamber for compressing working fluid therein, a discharge port through which the working fluid flows out from the compression chamber, and a valve for opening or closing the discharge port. According to one aspect of the present invention, as shown by way of example only in Figure 4, the valve has a valve seat portion 18 provided around the discharge port and having tapered surfaces so that a cross-sectional area of the discharge port increases in a direction away from the compression chamber 21. A valve 17 having a projection portion with a tapered surface is provided so that, in a closed position, at least a portion of the tapered surface is in contact with the tapered surface of the valve seat portion 18. The valve 17 has a flat surface portion provided at an end portion of the valve 17 on the side of the compression chamber 21. A retainer 20 positions the valve 17 on the valve seat portion 18. As set forth in independent claim 5 and as shown by way of example only in Figure 4, a bore 6a is provided in the end plate 6b which blocks an opening of the cylinder 4 (see figure 1). The retainer 20 is inserted into the bore 6a for holding the valve 17 opposed to the valve seat portion 18.

The Lorson patent discloses a discharge valve assembly which includes an valve guide and spring retainer having a continuous annular surface surrounding the discharge valve and operative to guide movement thereof. The valve is disclosed to include an arcuate lower peripheral surface portion defined by a surface of revolution of a curve, which surface may form the surface of a zone of a sphere. However, the Lorson patent does not disclose a bore provided in an end plate blocking an opening of the cylinder and having a discharge port provided therethrough, the bore being connected to the valve seat portion, and a retainer inserted into the bore for holding the valve opposed to the valve seat portion. Rather, a generally rectangular shaped

bridge member 64 is provided in Lorson to support guide member 40 within the discharge gas passage 34 and includes a bore 66 into which cylindrical portion 46 is secured. An enlarged diameter recess 68 is provided in the lower surface of bridge member 64 to partially receive radial flange portion 50 of guide member 40. Suitable bolts 70 are provided to secure bridge member 64 and the associated guide member 40 the valve plate assembly 16. This patent discloses, but does not show that the bridge member 64 and valve guide and spring retainer 40 may alternatively be manufactured as a single one piece construction.

While a bore 66 is provided in the bridge member 64 and a retainer inserted into the bore in Lorson, the bore is not provided in an end plate for blocking an opening of the cylinder, the end plate including a discharge port provided therethrough. Accordingly, in Lorson, the position of the guide member 40 and, therefore, the lead spring 44, is dependent on positioning of the bridge member 64 with respect to the valve plate assembly 16. On the other hand, according to the present invention, the bore into which the retainer is inserted is provided in the end plate and is connected to the valve seat portion such that the retainer can be accurately positioned. Such is neither disclosed nor suggested by Lorson.

Applicants note the Examiner has cited the Riffe patent as being relevant to applicants' disclosure. However, since this patent was not applied in rejecting claims formerly in the application, further discussion of this patent is deemed unnecessary.

The Examiner is advised that a substantive examination was recently issued in the Chinese Patent Office in an office action dated July 18, 2003. In that office action, the Chinese Patent Office cited two documents already of record in connection with the subject application, i.e., JP-08-31997 and United States Patent No. 4,543,989 to Lorson. Both of these documents are already of record in the

subject application, JP-08-31997 being cited in the office action mailed November 22, 2002 (although the PTO-892 contains a typographical error with respect to the document number) and the Lorson patent being cited by the Examiner in the outstanding office action. The following are applicants' comments concerning the differences between these documents and the presently claimed invention:

(a) JP 08-31997

In this prior art, the valve supporting member for supporting the valve body 16 (i.e., the member also supporting an end of the coil spring 18, but note being on the side of the valve) is separated from the main shaft bearing 5, on which the valve seat portion 17 is provided. For this purpose of fixing of that supporting member, it can be considered that it is fixed by means of a screw or a grommet (or eyelet), etc., however there necessarily occurs tolerance in the manufacturing thereof. Thus, it is necessary to provide other means for the purpose that no such a gap is caused inadvertently or carelessly between the valve body 16 and the valve seat 17.

The valve body 16 of the prior art is guided in the movement thereof, by means of the valve guide 19, thereby obtaining a predetermined sealing condition. However, the valve body 16 and the valve guide 19 are sliding on each other every time when they moves, and therefore wear or abrasion proceeds thereupon, thereby lowering the reliability of the valve body 16.

Consequently, according to the present invention, the holder member for supporting the valve body is fixed onto a hole or bore, being concentric to the valve seat portion, thereby achieving an effect that the position of the holder member can be done, easily, and the positioning of the valve itself, as well.

(b) U.S. Patent No. 4,543,989

In this prior art, a discharge valve guide and spring retainer 40 for guiding a discharge valve 42 are fixed on a bridge member 64. However, as is shown in Fig. 1, thereof, clearly, the diameter of each of the holes or bores provided for the bolts 70 of the bridge member 64 is larger than that of the bolts 70, and for this, the discharge valve 42 cannot be positioned at the target position, in the structure thereof.

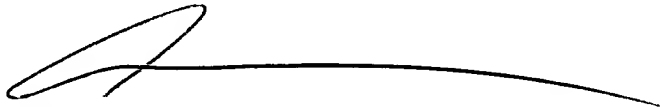
Consequently, this prior art also differs from the present invention, in particular in the structure thereof, similar to the prior art mentioned above.

In view of the foregoing amendments and remarks, favorable reconsideration and allowance of all of the claims now in the application are requested.

To the extent necessary, applicants petition for an extension of time under 37 CFR 1.136. Please charge any shortage in the fees due in connection with the filing of this paper, including extension of time fees, to the deposit account of Antonelli, Terry, Stout & Kraus, LLP, Deposit Account No. 01-2135 (Case: 520.40206X00), and please credit any excess fees to such deposit account.

Respectfully submitted,

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FIG. 1(a)

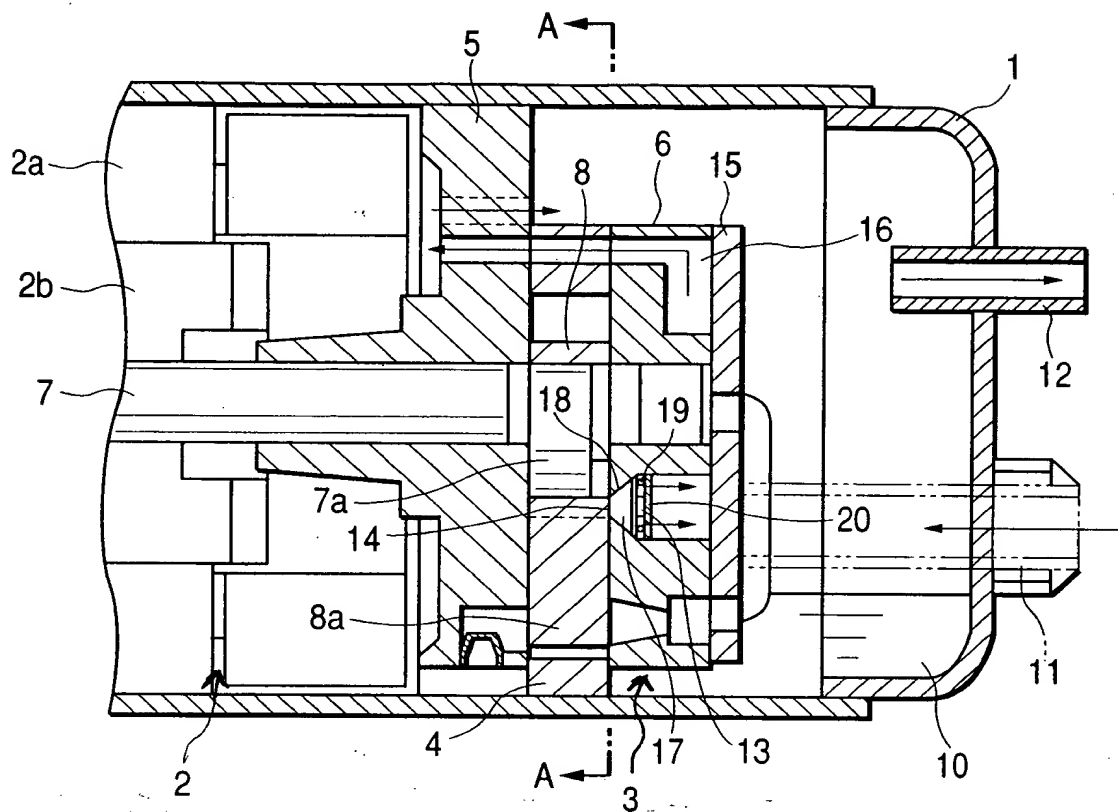


FIG. 1(b)

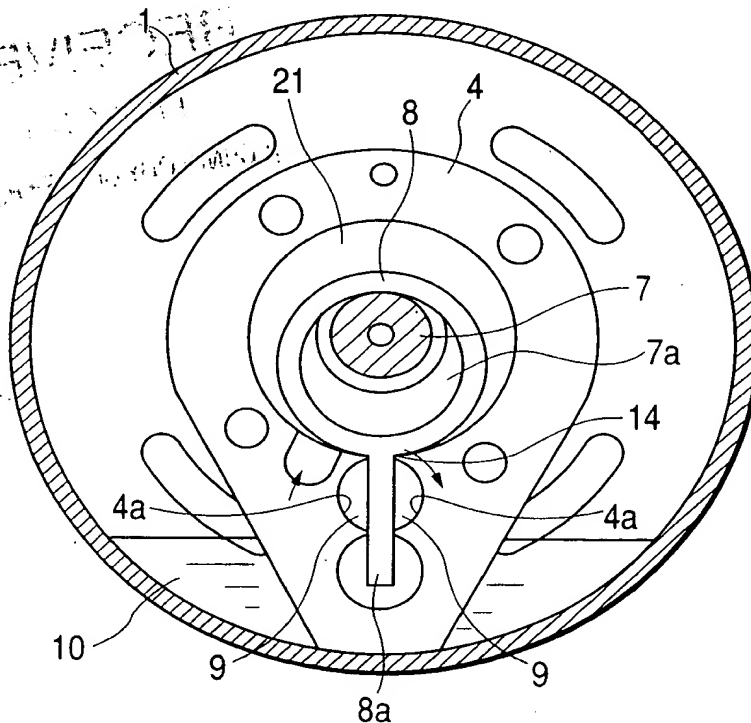


FIG. 2

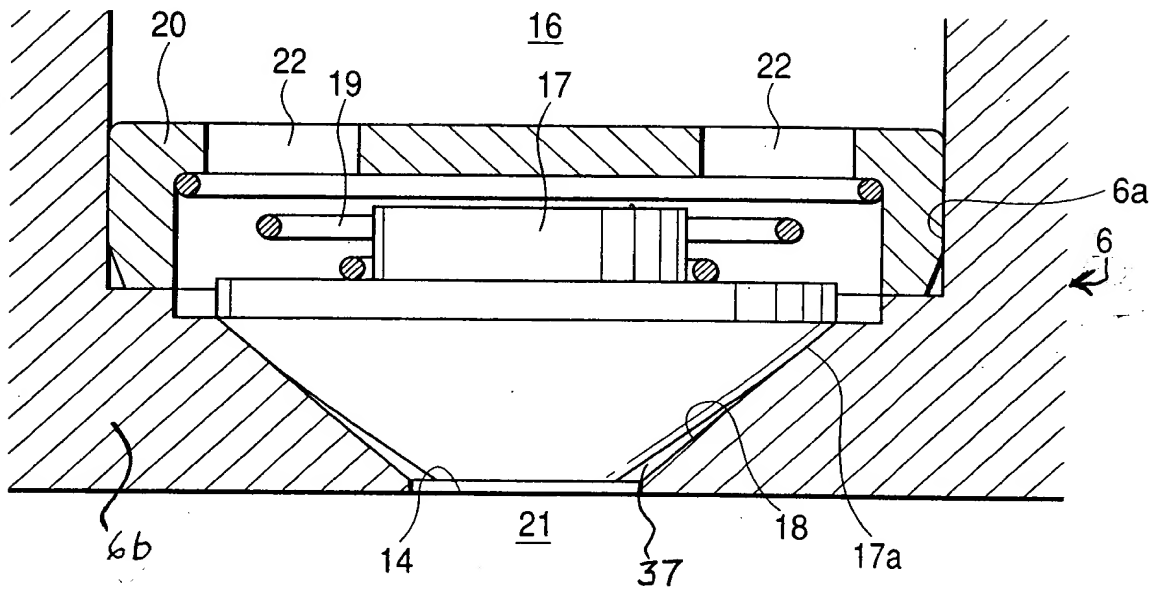
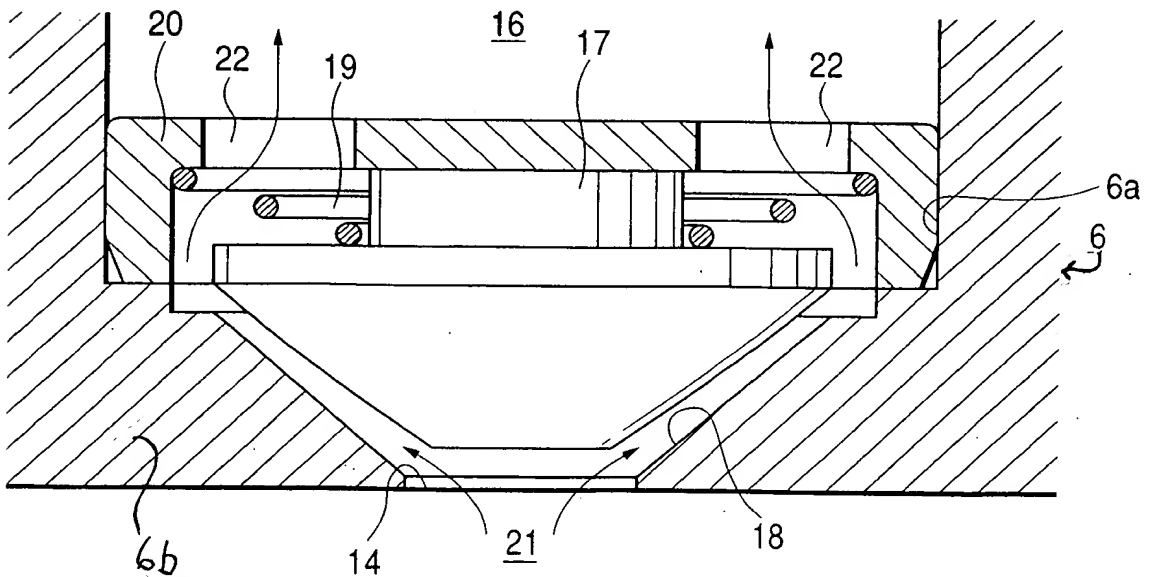


FIG. 3



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FIG. 6(a)

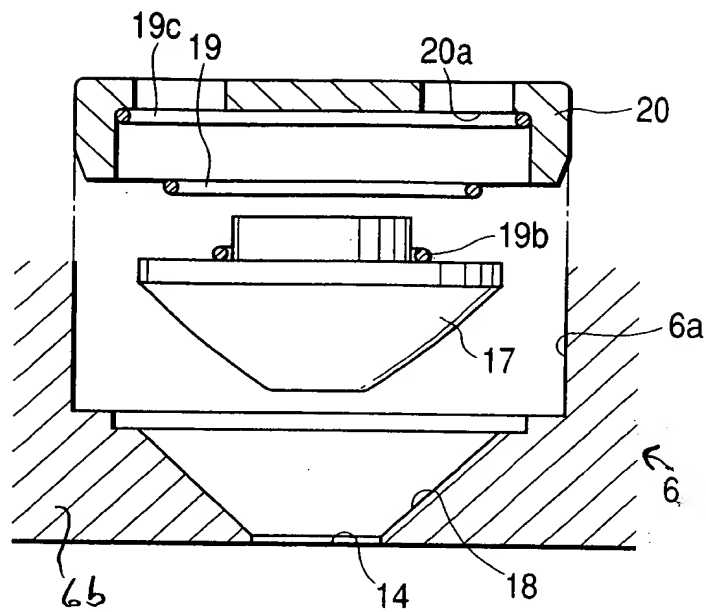


FIG. 6(b)

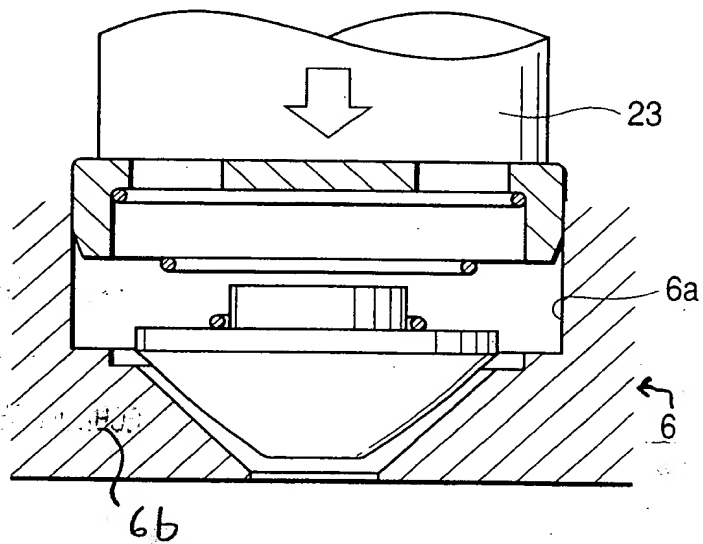


FIG. 6(c)

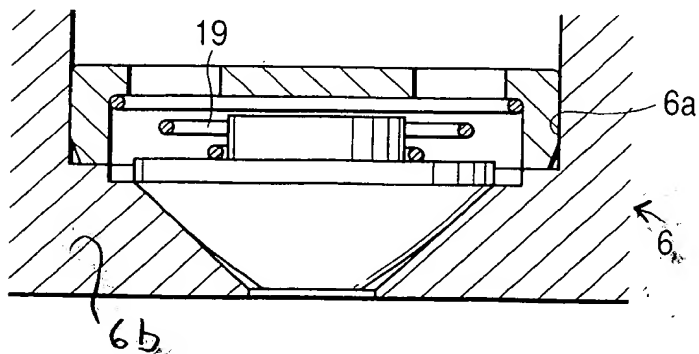




FIG. 8(a)

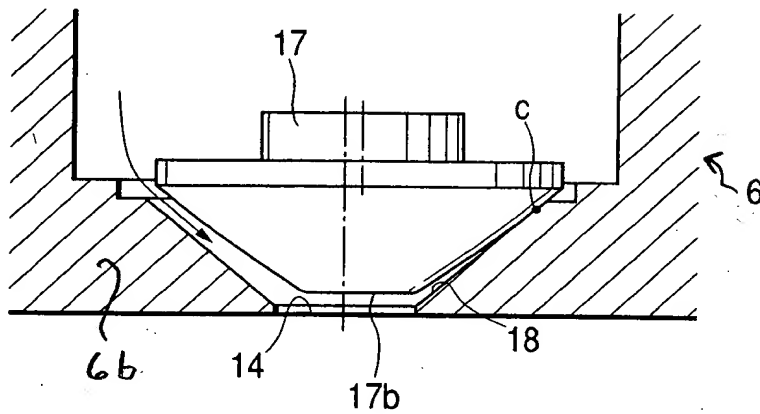


FIG. 8(b)

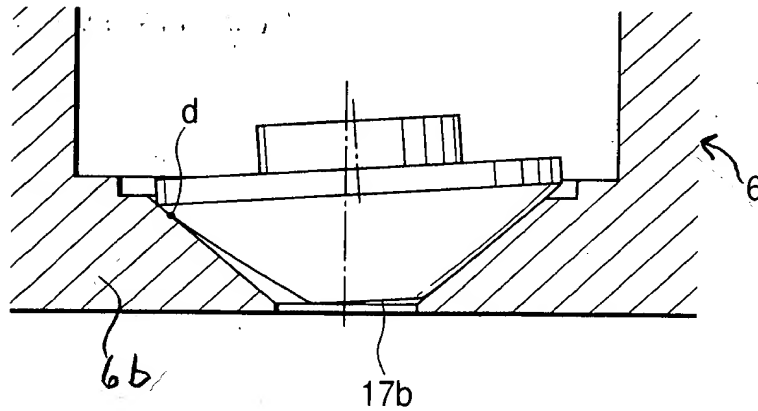


FIG. 9(a)

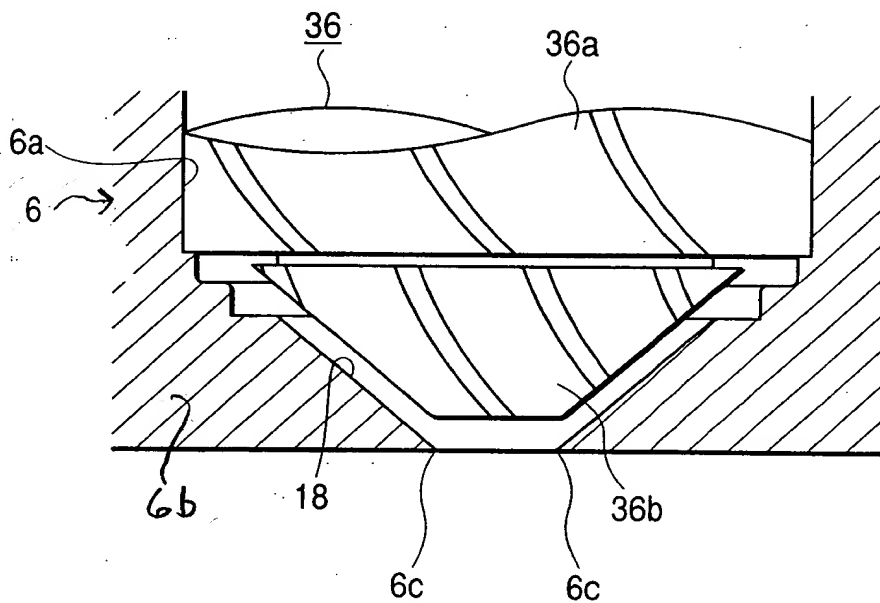


FIG. 9(b)

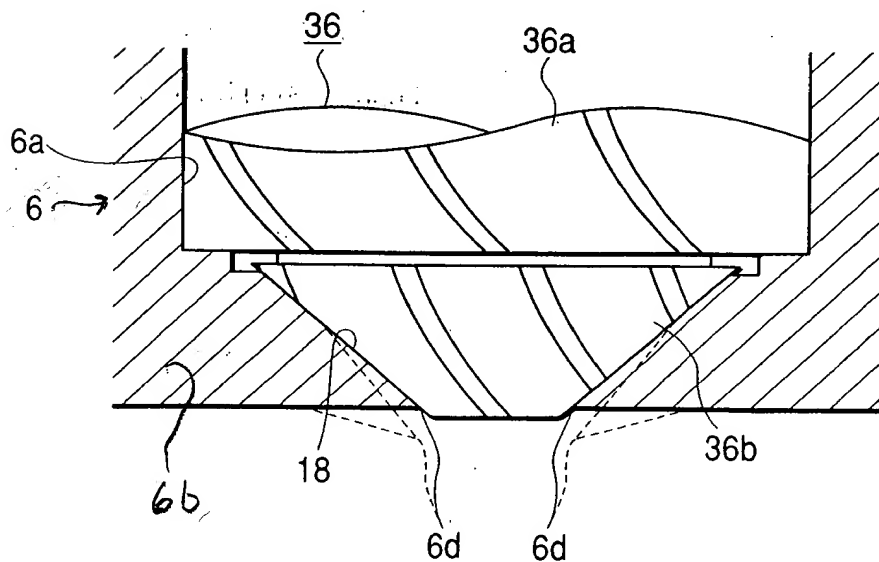




FIG. 10(a)

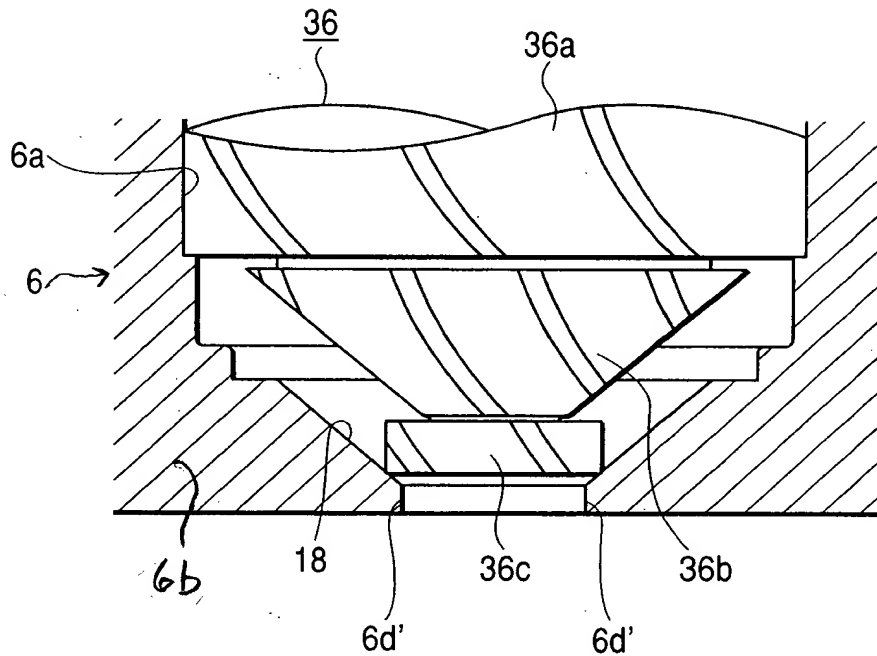
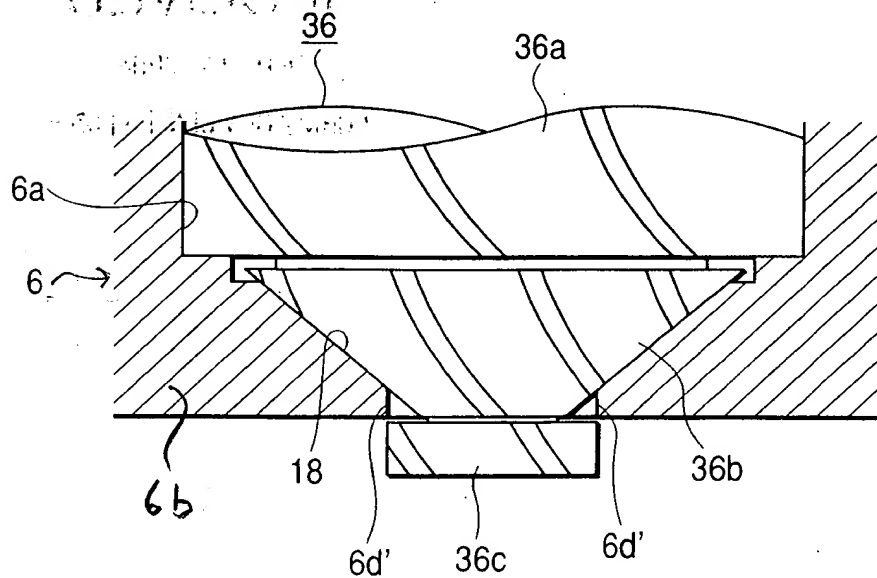


FIG. 10(b)



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FIG. 13

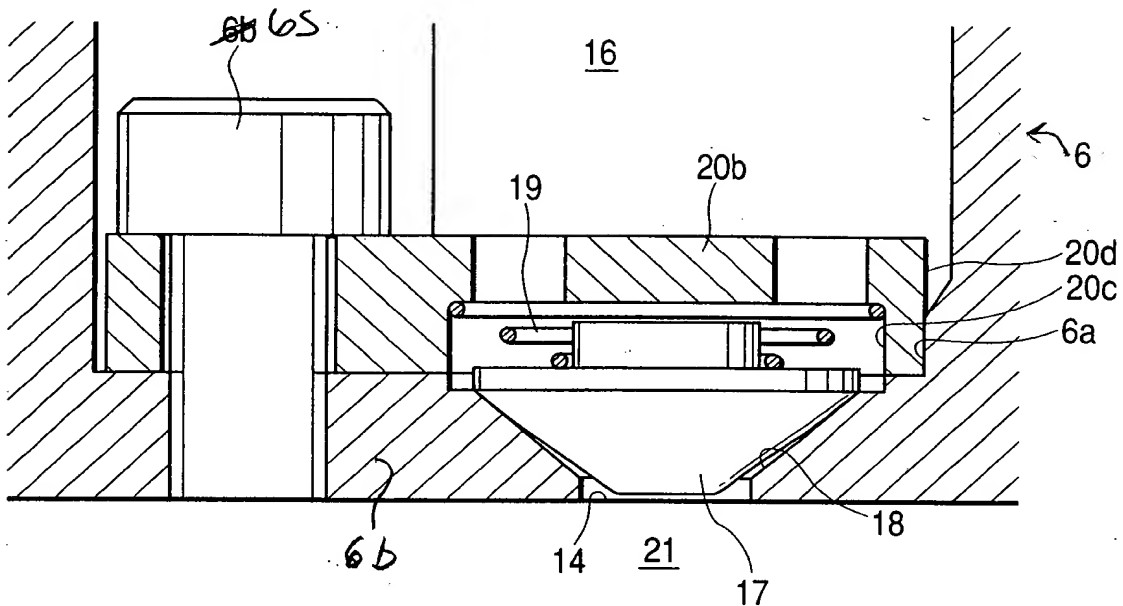


FIG. 14

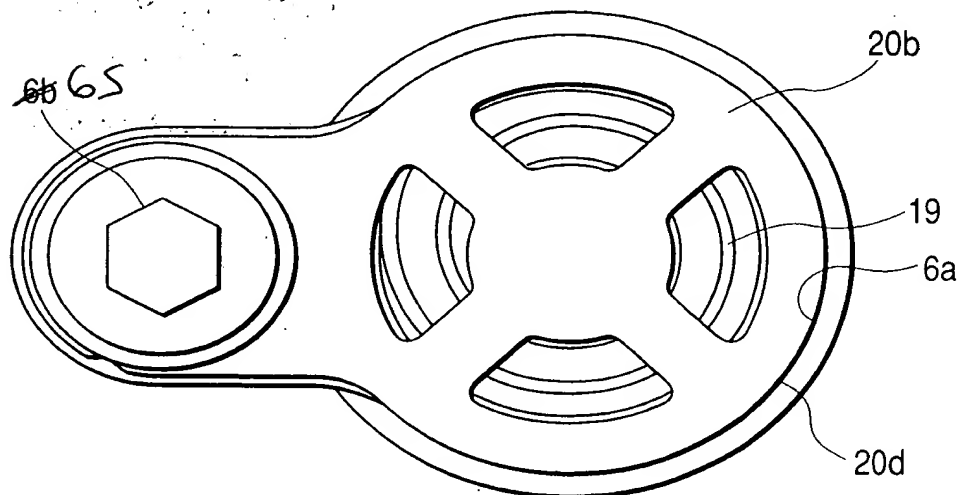


FIG. 15

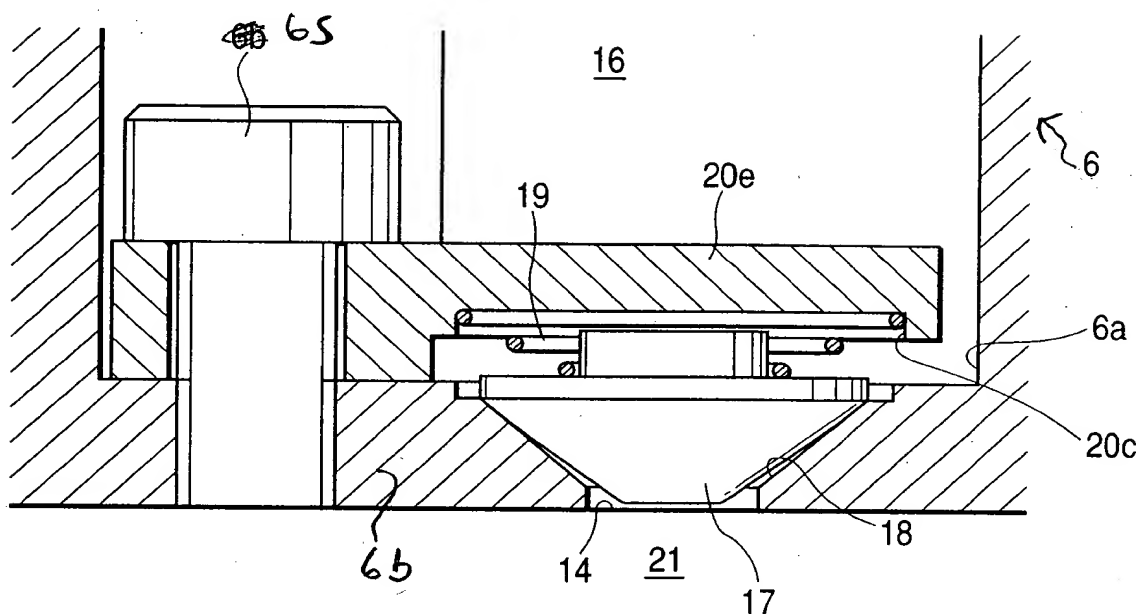


FIG. 16

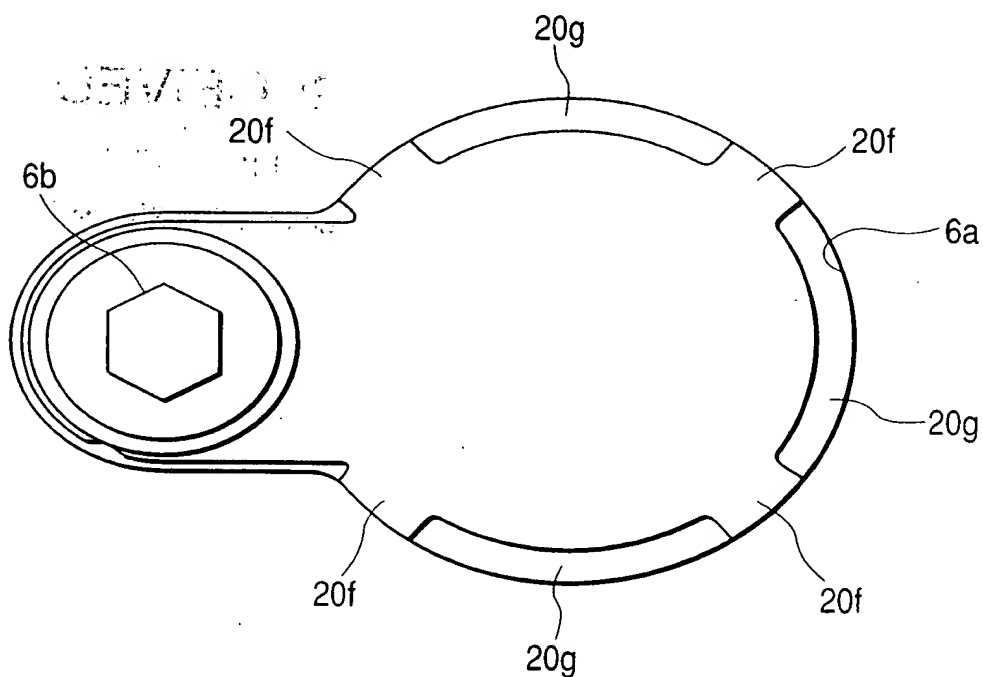




FIG. 17

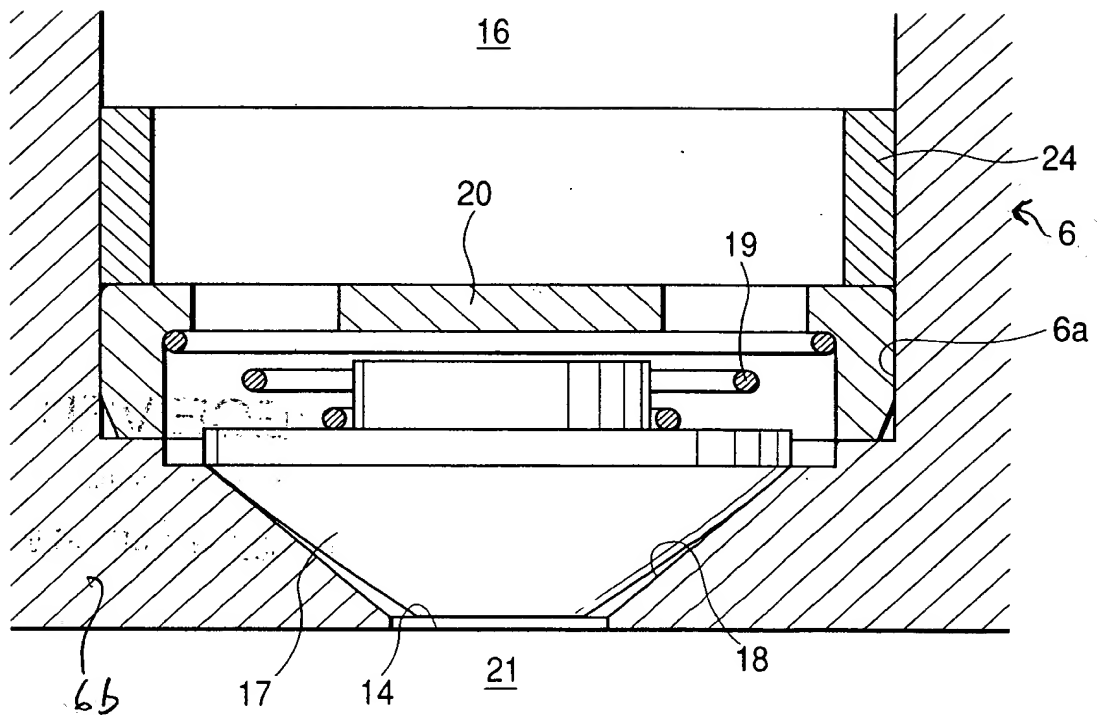




FIG. 19

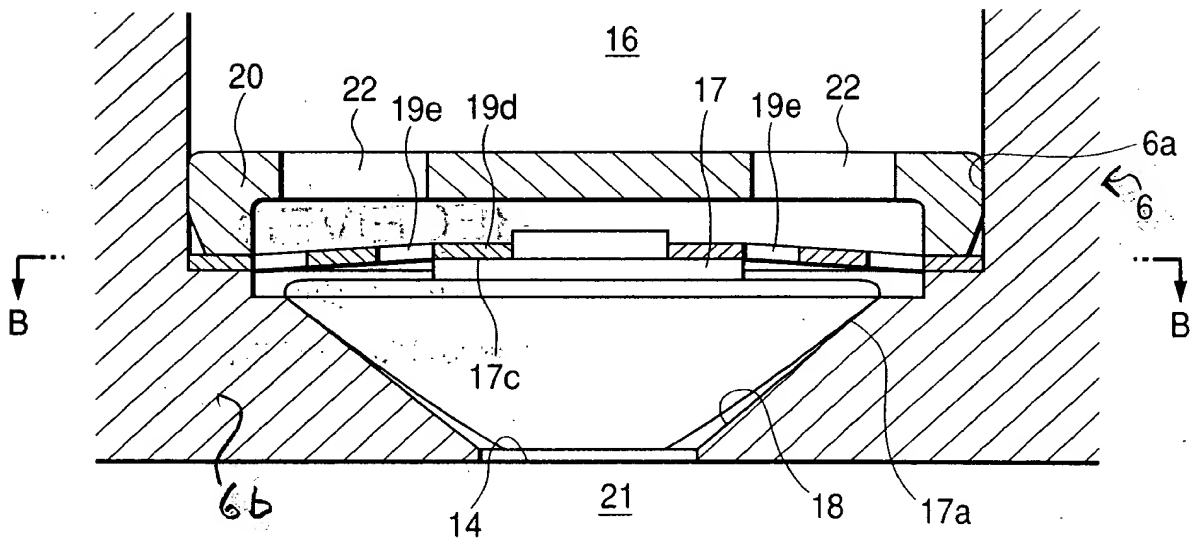
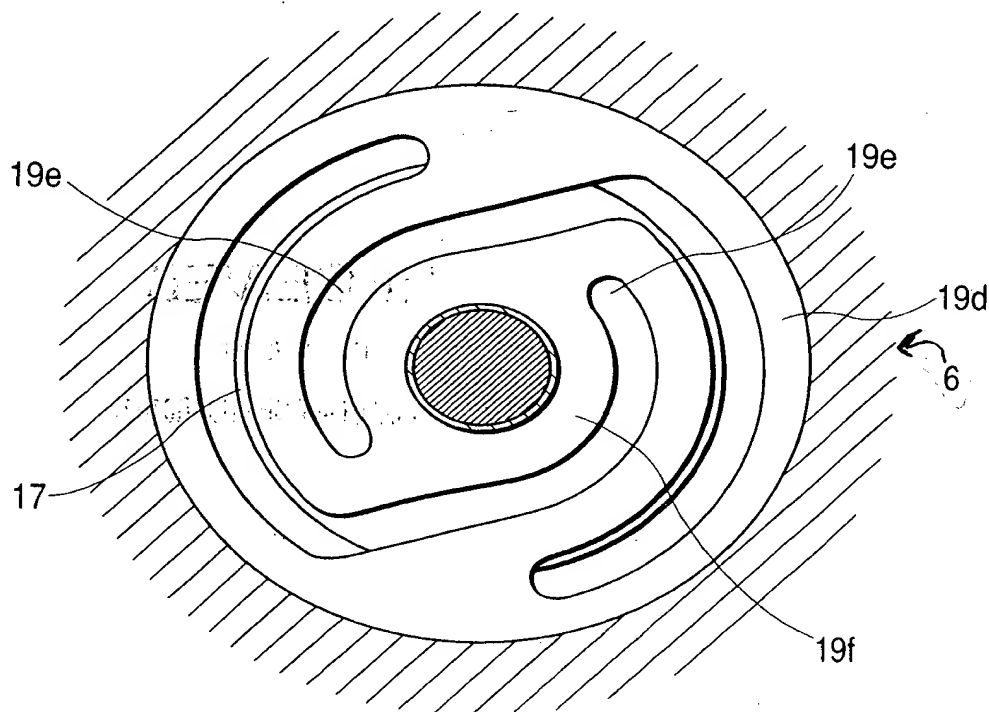




FIG. 20



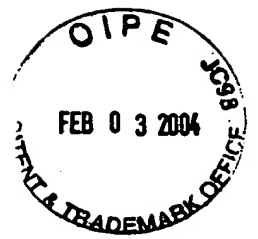


FIG. 21

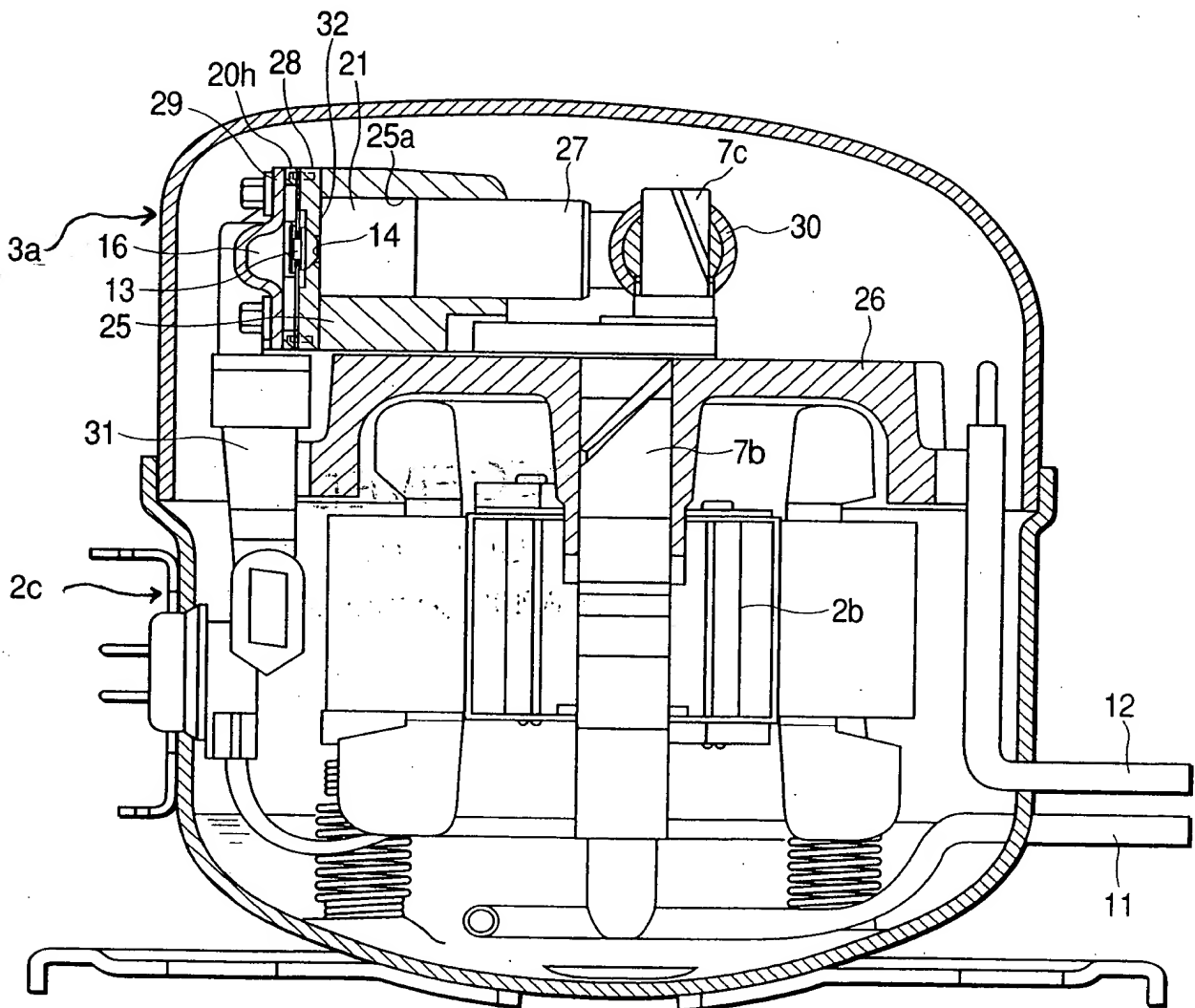
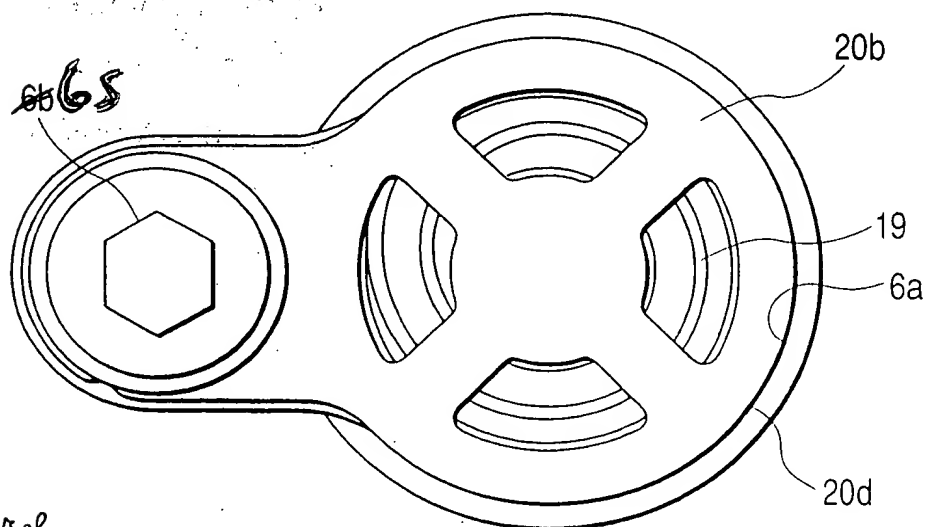


FIG. 13



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FIG. 15

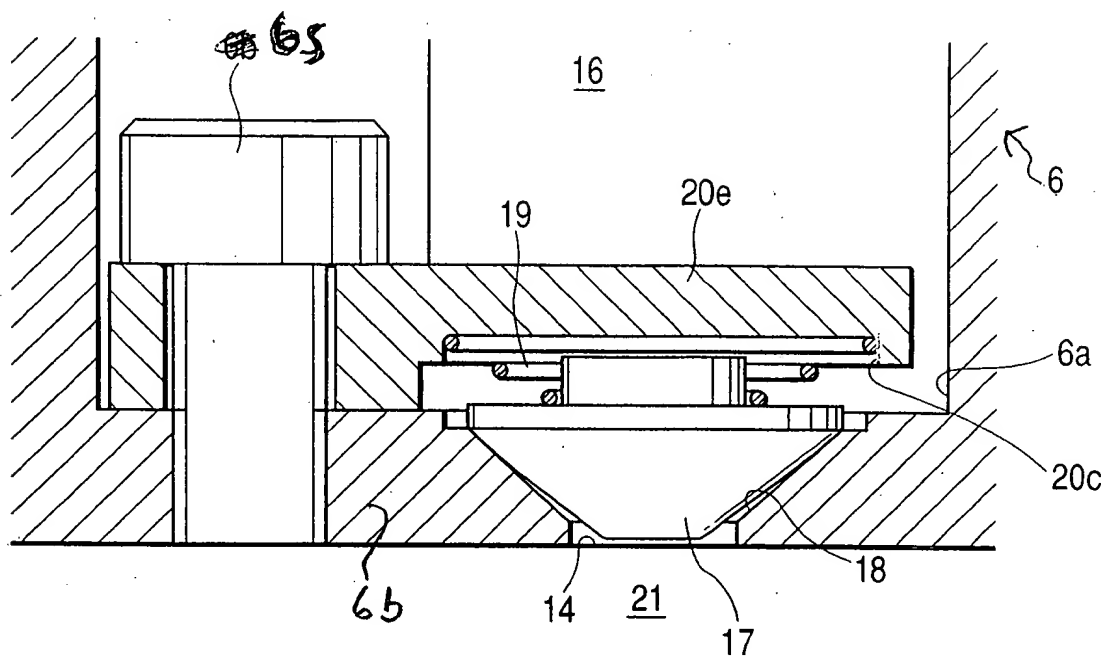
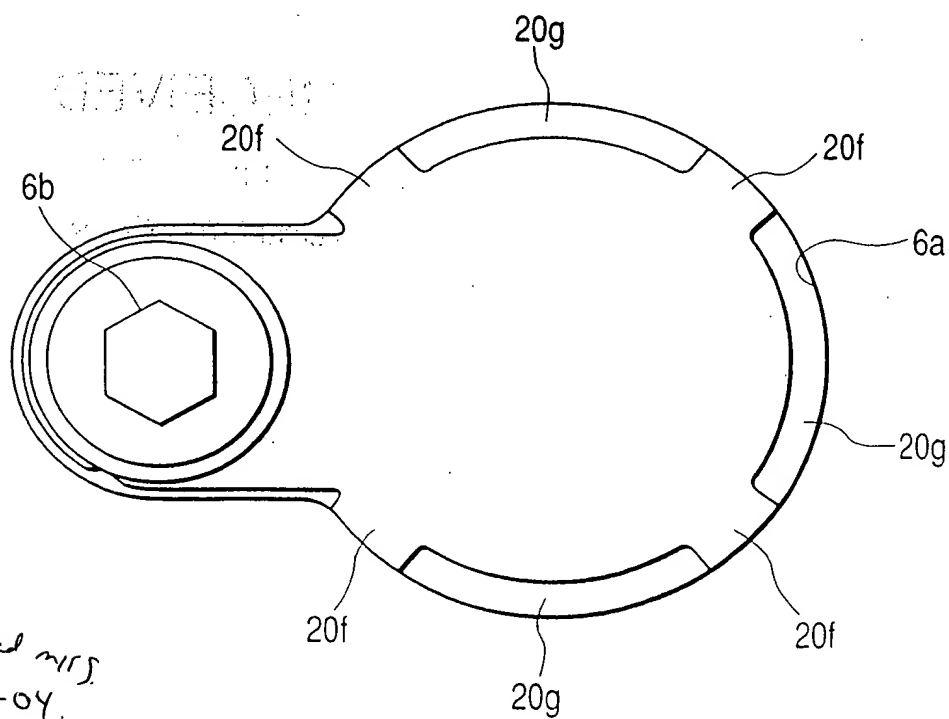


FIG. 16



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